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**A COMPARATIVE STUDY OF PREDICTORS OF ACADEMIC ACHIEVEMENT
FOR AGRICULTURAL COLLEGE STUDENTS,
EMPLOYING ACADEMIC, DEMOGRAPHIC,
AND PSYCHOLOGICAL VARIABLES**

by

Deborah Brittan

A Thesis

**Submitted to the Faculty of Graduate Studies and Research
through the Faculty of Education
in Partial Fulfilment of the Requirements for
the Degree of Master of Education at the
University of Windsor**

Windsor, Ontario, Canada

1997



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ABSTRACT

This study was designed to examine variables which may predict academic success at a College of Agricultural Technology. One hundred and seventy-three first-year students - 99 males and 74 females - were tested to determine their pre-college accreditation in English, Math, Biology and/or Chemistry, their farm or non-farm backgrounds, locus of control, motivation for learning, Canadian Adult Achievement test scores, personality characteristics, and first-semester college grades. Regression analyses were computed to determine those variables predictive of academic success. Scores on standardized tests of literacy and numeracy skills were predictive. No significant relationship was evident with the other variables, leading to the conclusion that pre-admission accreditation, demographic characteristics, and the psychological measures tested did not predict academic achievement. Thus, the hypothesis that proficiency in the fundamental disciplines of literacy and numeracy generalize to enhance performance in college was justified. It was suggested that incumbent on colleges and universities is responsibility for bridging the gap in literacy skills experienced by those applicants who have completed secondary school, but have not acquired adequate facility in communication to enable them to achieve success in their personal and professional lives.

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CHAPTER I

Introduction

A grade: "An inadequate report of an inaccurate judgment by a biased and variable judge of the extent to which a student has attained an undefined level of mastery of an unknown proportion of an indefinite material" (Dressel, 1983, 12).

Paradoxically, the grading system is unsurpassed as an instrument of comparison, and is the most efficient means currently available for rating student abilities and proclivities. Why are grades so important? While most would agree their calculation is a somewhat arbitrary measure of a combination of elusive elements, the academic grade has been accepted as an expert designation in North America since the first grade was assigned at Yale in 1783 (Milton, O., Pollio, H.R., & Eisen, J.A. 1986).

The grading system is here to stay; this study is concerned with the possibility of using grades, or other factors, to predict student academic achievement. For a multitude of reasons (economic, sociological, psychological), a reliable scale for predicting student success would be invaluable. At the design and manufacturing end of the higher education tunnel, College administrators could adapt a formulaic approach to the admissions process, and select candidates most likely to succeed in their institutions. Students, at the 'product' end of the tunnel, could benefit from participating in a process tailored to assist them achieve their potential. The ability to predict future academic success could be used in career counselling of high school students, possibly reducing emotional, financial and other kinds of stress. The bottom line mentality prevalent in our society today might be served by directing increasingly scarce financial resources towards preparing high school students specifically for future education in particular disciplines. Although this idea embodies undertones of social engineering, it does not seem incongruent with contemporary political and economic policy.

General Statement of the Problem

Any student beginning college or university faces challenge and uncertainty, as well as opportunity. Many factors impinge on students' achievement of academic success. This researcher proposes to examine several of those factors in an attempt to determine which single factor, or combination of factors, functions as the best predictor[s] of academic achievement for use in projecting student academic performance.

In particular, the study aims to identify predictors of academic achievement at a southwestern Ontario college, Ridgetown College of Agricultural Technology (University of Guelph) - RCAT.

All Junior students accepted for registration in any of the six major programs of study offered at RCAT - Agri-Business Management (AGB); Field Crops Production (FC); Livestock Production (Lvsk.); Horticulture, Landscape Design, & Nursery Management; Fruit & Vegetable Production (Hort./F&V); and Veterinary Technology (V.T.) - are required to possess an Ontario Secondary School Diploma. The Admissions Requirements section of the College calendar includes a recommendation that students have at least General Level credits in Chemistry, Mathematics, and Biology, because the College's programs include a heavy emphasis on those and related sciences. Many applicants have completed O.A.C.s, and some have University degrees or College diplomas (Ontario Ministry of Agriculture, Food and Rural Affairs, 1995). Does a student's entry level of academic accreditation affect his or her achievement at RCAT?

In further consideration of academic measurements, College administrators employ standardized aptitude testing at the beginning of Semester One. The instruments - the Canadian Adult Achievement Tests for Reading Comprehension, English, and Numeracy - are used for the purpose of identifying students at risk in one or more of the areas tested. These particular disciplines were

selected for measurement because they test those fundamental skills [deemed] necessary for a student to succeed or for an adult to function in today's society (The Psychological Corporation, 1989). Students are advised of weaknesses suggested by their test results, and are provided with opportunities for improvement. Do scores on these tests significantly predict academic performance?

As is to be expected, given that RCAT is an agricultural college, many of the students have farm, or at least, rural backgrounds. Increasingly, however, enrolment reflects the general population, and many students come from small suburban centres or even from large cities. A question posed in this study is whether or not students with farm backgrounds enjoy a distinct advantage, one profound enough to affect their prospects of academic success at the College.

Traditionally, the majority of Juniors at RCAT are students who enter the College either directly after finishing Secondary School, or only a few years later and are, therefore, in their late teens or early twenties. However, due to economic trends and the availability of employment opportunities for agricultural college graduates, mature students are becoming a more significant element within the student body. The effect of age (and presumably, maturity and experience) on student academic achievement is questioned here.

In addition to previous academic performance and demographic factors, psychological characteristics such as personality type and locus of control might also affect a student's potential for academic achievement. Motivational style - in large part, a correlative of locus of control, will also be noted.

CHAPTER II

Review of the Literature

Academics

As noted in Wolfe and Johnson's 1995 study, the Scholastic Aptitude Test (SAT) is used to determine admission to many colleges and universities (Educational Testing Service, 1948-1993). However, Wolfe and Johnson questioned the usefulness of that procedure. They studied 201 students (157 women, 44 men) at the State University of New York. Average grades earned in high school, total SAT scores, and 32 personality variables were examined via forward multiple regression analyses in order to identify the best combination for predicting GPA (Grade Point Average) in college. The researchers reported a correlation between high school grades and GPA that was slightly higher ($r=.40$) than that between SAT and GPA ($r=.34$) (Wolfe & Johnson, 1995) - a finding they had anticipated, based on other investigators' results. Average high school grades correlated moderately (.41) with SAT. Fourteen of the personality variables examined were significantly associated with GPA, five with high school grades, and three with SAT. Forward multiple regression analysis was computed using those same personality variables, with average high school grades and SAT scores included as predictors. The results clearly showed high school average entering first with predictive value in terms of college GPA (an increment in R^2 of .19 when $p<.01$, as opposed to .05 for SAT total and (an average of) .06 for the personality variables). Wolfe and Johnson reported finding the R^2 for SAT alone was .12. Thus, the value of SAT as a predictor of GPA was found to be quite redundant when high school record was included, findings consistent with those of Willingham, Morgan and Ramist (1990).

Schuler, Funke and Baron-Boldt (1990) attested to the value of final high school grades for

the prediction of university examinations by reporting they matched the validity of the best psychological predictors in personnel selection. The researchers used Schmidt and Hunter's method of validity generalisation (Schmidt & Hunter, 1978) to calculate a meta-analysis using 63 German studies with 102 independent samples and a total sample size of 29,422 subjects. They examined the mean predictive validity of final school grades for the prediction of university examinations, and for predicting success in vocational training. The mean corrected validity of the school average grade for the prediction of success at university was $q=0.456$, in a magnitude which, the researchers concluded, confirmed it as the best individual predictor for academic success (Schuler et al. 1990). The corrected mean validity for the prediction of vocational success from final school grades was $q=0.408$. Schuler et al. observed that predicting theoretical educational success in vocational training was more successful than predicting practical achievement, based on final high school grades, because the former requires more cognitive components.

In his study, *Effects of Ability, High School Achievement, and Procrastinatory Behavior on College Performance*, Wesley (1994) observed that "grades earned in high school are taken as an estimate of the student's overall effectiveness in scholastic endeavours [while] the SAT is usually considered a measure of intellectual ability." (p. 404). He reported that many college admissions procedures use a combination of the two predictors to make selection decisions. His study of 195 women and 54 men used high school average, SAT score, and two personality variables (procrastinatory behaviour and self-handicapping) to compute forward multiple regression. Results showed high school average to be the strongest predictor of GPA for the male students (.34) correlated with SAT scores and procrastinatory behaviour. In contrast, high school average was the weakest of the three variables for women in the study (.03) (Wesley, 1994, 407). Aptitude test

scores were more predictive of women's college GPA scores (.16), a finding consistent with Seashore (1962).

Baron and Norman's (1992) study results suggested that, when average achievement test scores and high-school class rankings were available, SAT scores were redundant. A total of 4170 students at the University of Pennsylvania composed the study sample. Their SAT scores, the mean of three College Entrance Examination Board Examination tests, and the students' high-school class-rank were used in multiple regression to compute which added significantly to CUM (cumulated grade point average at the university). A correlation between each of the three elements and CUM was discovered, but regression weights indicated the SAT (.199) was not useful when achievement on the Entrance Examinations (.261), and high-school class-rank (.305), were known. This supports the argument of Crouse and Trusheim (1988) that high-school grades are better predictors of college performance than the SAT, and that the small contribution to predictability realized by including SAT in the prediction formula is not worth the trouble of doing so. An earlier claim endorsing the relevance of high school achievement to scholastic achievement in college is found in Willingham's 1985 work, Success in College. Thus, grades in high school should be primary in research which focusses on predicting college success.

Demographics

Feller (1974) studied the impact of rural-urban differences on academic achievement among college students, by testing to find whether or not rural-urban differences in scholastic achievement in college persisted even after controls for social class, sex, and intelligence testing were introduced. Previous researchers, specifically Schnore (1966) and Gans (1962), claimed that social class and

community type influenced a wide range of individual behaviour. Others (Blau & Duncan, 1967, and Ramsoy, 1969) emphasized the impact of the rural-urban environment of the schools in determining educational experiences and outcomes. Still others (Wilson, 1959; Turner, 1964; and Coleman, 1965) attributed substantial significance to the socioeconomic variable.

Feller's (1974) study sought to isolate the influence of rural-urban differences on college achievement. Seven hundred and twenty-nine full-time, unmarried, male and female students who were Caucasian, native-born, and between the ages of 17 and 20 participated in the study. [Criteria for allocating rural or urban classification and social class status were not included in the study report.] Bivariate analysis revealed that rural students in the study sample performed at a slightly higher level in high school and, on average, attained higher measured intelligence test scores on the verbal aptitude test, but lower on the quantitative one. Urban students attained higher first-year and cumulative grade point averages in college, and had a higher percentage of graduates. Rural upper class students had significantly higher grade point averages in high school ($\alpha = .0005$), urban middle class students had significantly higher first-year and cumulative GPAs in college than rural middle class students ($\alpha = .05$), and urban males were more likely than rural ones to graduate ($\alpha = .05$). Feller concluded that, in general, the rural-urban differences in academic performance in high school and college were very slight for the students in the sample. But, the combination of traits (rural-urban background, social class, and gender) delineated distinctive achievement types. Cross-tabulation of each dependent variable with urban-rural background, controlling simultaneously for sex and social class, yielded twelve sex-class-rural-urban types. Ranking the types according to relative academic performance showed the top third of the twelve types of achievers consisted mostly of urban, non-middle class, female students, and the lower third of all the types was composed of

rural, middle-class males. Therefore, the literature presages some predictive ability of demographic data (though, possibly, not of a statistically significant degree) in the current study.

Psychological Factors

Personality type: Holland's VPI (1985) consists of eleven scales denoting six personality types (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional), and five attitudinal variables (Self-Control, Masculinity-Femininity, Status, Infrequency, and Acquiescence). Respondents prioritize their interest, or dis-interest, in 160 career choices. Those choices are clustered, and their selection assumed to denote specific personality characteristics associated with the six personality type classifications constructed by Holland, as well as ratings on the five nonintellectual variables scales. The personality type is measured by the highest score, and a personality pattern is obtained by ranking scores from highest to lowest.

High scorers on the Realistic scale are individuals who can be described as practical, hardheaded, and who value concrete things like money, power and status. They perceive their strengths as being mechanical in nature, prefer manipulating tools, objects, and machines, and consider themselves weak in terms of human relations.

Investigative types, who see themselves as scholarly, intellectually self-confident, and having scientific ability, like to use investigative skills to solve problems. They value science, and can be described as analytical, precise, and independent. However, they are shy, reserved, and see themselves as lacking in leadership ability.

High ratings on the Artistic scale characterize respondents as imaginative, emotional, and expressive. These individuals see themselves as original, intuitive, and having artistic and musical

ability.

Social types like to work with others to inform, train, develop or enlighten. They are cooperative, helpful, kind and understanding, but see themselves as lacking mechanical and scientific abilities.

High scorers on the Enterprising scale are enthusiastic, adventurous, extroverted, dominant types. They see themselves as possessing good leadership and speaking abilities, but lacking in scientific ability. They value political and economic achievement, and can be described as ambitious, domineering, and self-confident.

Individuals classified as Conventional types by their high scores on that scale are persistent, practical, conforming, and efficient. They enjoy routine activities like manipulating data, and view themselves as having clerical and numerical ability.

A high score on the Self-Control scale is indicative of a personality which is very much in control. High-scoring males are viewed as responsible and persistent, while high-scoring women are considered serious, having few interests. Low scorers are characterized as impulsive and unable to control behaviour (Holland, 1973).

Ratings on the Masculinity/Femininity scale indicate the impact of traditional sex-typing on an individual's vocational planning. High scores reflect the frequent choice of occupations traditionally preferred by males, while low scores indicate a preference for occupations traditionally favoured by females. Thus, while a high score for a male would predict the choice of a traditionally male occupation, the same high score for a female would indicate a preference for non-traditional female occupations (Holland, 1985).

The Status scale measures an individual's interest in prestige and power as well as his or her

level of self-confidence. High scorers on this scale are sociable, adventurous, expressive, and want to be important (Holland 1985).

The Infrequency scale scores relates to respondents' views of how they fit into the working world. High scorers feel good about their abilities, personalities, and the future, while low scorers can be described as having deviant tendencies (Holland, 1985).

Individuals who score highly on the Acquiescence scale are typically dominant, enthusiastic, and have many interests; they are sociable, cheerful, and relatively conventional. They can be categorized in one of two ways: hyperactive, and demonstrating poor judgement, or well-integrated, with lots of interests and talents (Holland, 1985).

The last two scales (Infrequency and Acquiescence) are useful in detecting extreme response biases (Holland, 1985).

Holland's research (1973) indicates that Realistic types typically enter technical and skilled trades. In the context of Agricultural College graduates, corresponding occupations could include positions like Farm Manager, Livestock Technician, or positions in Production Management. Investigative types most often enter scientific occupations (Agricultural Research, Food Processing, Veterinary Laboratory Technician). Occupations which utilize their artistic and musical ability are typically chosen by Artistic types (Landscape Design Technician, Greenhouse Manager). Social types often choose teaching and helping occupations (Agronomist, Agricultural Sales), while Enterprising types usually choose supervisory and sales occupations (Crop Consultant, Custom Equipment Operator, Lawn Maintenance Technician). Conventional types, who value business and economic achievement, prefer clinical occupations (Farm Tax Accountant, Grain/Commodities Trader).

Locus of Control: Locus of control, an innately individual characteristic possessed by each person,

refers to perception of the causality of elements in one's environment. If people believe outcomes are contingent on their own behaviour, they are said to have an internal locus of control. Conversely, persons who believe that independent factors beyond their control are the determining agents of outcomes affecting their lives have an external locus of control.

Since the early 1950s, psychologists have delineated attributions for causality into two approaches: internal and external. Rotter (1954) distinguished between internal and external locus of control, and later (1966) developed the I-E Scale to measure and compare individuals' behaviour in this context. Other researchers (Fontana et al. 1986; Frieze, 1976; Kahoe, 1966; Mitchell, 1992; Rea, 1991) established the association between locus of control and academic achievement. Their studies support the idea that an individual's learning process and behaviour are influenced by his or her locus of control and subsequent attribution of causation for academic success or failure.

Levenson expanded the framework of the locus of control concept to embrace two interpretations of the 'external' perspective, in addition to the previously identified 'internal' control concept. Hersch and Scheibe (1967) had already observed the unsatisfactory inexactitude of explaining any behaviour not attributed to internal locus of control by declaring it simply 'external', and had noted the possibility of further delineations of attribution of causation. Levenson polarized 'internal' locus of control, and then dissected 'external' and posed two distinct attributions within that paradigm: chance, and powerful others. (Levenson, 1972, in Lefcourt (1981).

Krovetz' (1974) study observed that academic success is attributed to skill by internals, while externals credit chance for their achievement. This claim is supported by Agnew et al. (1993) , who specifically asked how locus of control is related to agriculture students' academic achievement. The

researchers concluded that students with an external locus of control had lower academic achievement; the higher degree of control over outcomes perceived by internals resulted in more appropriate academic behaviour and higher academic achievement (p. 27).

Further research (Prociuk & Breen, 1974) supports the claim that individuals characterized as internals achieve higher academic standing. This finding follows logically from the premise that internals perceive their own behaviour to influence outcomes: that is, they invest more time and effort, in the belief that better results will accrue, which is almost inevitably what happens.

Rotter (1975) noted that locus of control instruments developed to measure the effect of the construct in specific contexts would provide a basis for more precise predictions than would more generalized ones. Subsequently, unique measurements in a diversity of areas, including health, marital satisfaction, and alcohol use, among others, were developed, and appear in Lefcourt (1981). In 1985, Trice formulated an academic locus of control scale for college students, designed specifically for that group; previous academic/achievement scales (for example, Crandall, Katovsky, & Crandall, 1965) had measured school children's attributions for academic success. However, since the expectation of varying responses from older students is considerable, a more current scale, tailored for older students, was warranted, and will be used in this study (Trice, 1985).

Motivational style: A discussion regarding motivational style necessitates recognition of two types of motivational forces: intrinsic, and extrinsic. Intrinsic motivation is an inherent force within an individual, such as a desire for self-fulfilment or feelings of competence and accomplishment. Extrinsic motivation encompasses reinforcers - rewards and penalties - emanating from sources external to the individual, and involves participation as a means to an end. Lowman (1986) notes that a behaviour can never be said to be intrinsically or extrinsically motivated (p. 137); the only

uncertainty involves how strongly each motivational force is operating in a given situation. Students often engage in academic behaviour, prompted by external motivators such as grades, awards, or other tangible results, but discover such interest and pleasure in the activity itself that internal motivation compels them to continue.

In 1985, Deci and Ryan postulated a third type of motivational source: amotivation. Individuals who are amotivated are not able to recognize outcomes as being contingent on their own behaviour. These people cannot be typified as being either intrinsically or extrinsically motivated: they assume no responsibility for their own actions, but rather attribute their behaviour to forces beyond their own control.

Mitchell's 1992 study sought to determine the correlation between intrinsic and extrinsic motivation, and self-assessment of motivation. Results revealed that both intrinsic and extrinsic motivation were distinguishable patterns in behaviour. Regarding self-assessment of motivational strength, intrinsic motivation was found to be positively and significantly related, while negative motivation was negatively and significantly related (p. 151). When examining motivation and GPA (a measure of academic achievement), Mitchell concluded that extrinsic motivation was a better negative predictor of GPA than intrinsic motivation was a positive predictor. In summary, review of the literature treating these psychological factors: personality type, locus of control, and motivation for learning, establishes expectations for identifiable profiles.

A tripartite taxonomy of intrinsic motivation was proposed by Vallerand et al. (1989): intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation. The present study, however, will employ Levenson's distinctions between internal ascription, and attribution of causation to chance, or powerful others (Levenson, 1972).

Research Questions and Hypotheses

This study will examine correlations between academic, demographic, and psychological data, and first term academic achievement at RCAT. Particular research questions are as follows:

Will pre-admission accreditation in English, Math, Biology and/or Chemistry be shown to correlate significantly with first-semester academic achievement? Will farm or rural background relate to academic achievement? Will personality type (as measured by Holland's Vocational Preference Inventory), locus of control (as measured by Trice's 1985 Academic Locus of Control scale), or motivational style (as measured by Mitchell's 1992 Questionnaire on Learning) correlate with academic achievement?

Three models are employed in examining relationships. In the Academic model, correlations between the dependent variable (academic achievement as measured by first-semester final average) and four independent measures (pre-admission accreditation in English, Math, Biology, and/or Chemistry; and CAAT scores in Reading Comprehension, Numeracy, and English) are examined. The Demographic model uses three independent measures (Farm or Non-farm Background, Age, Gender), correlated with Final Average. In the Psychological model, personality type (as measured by Holland's (1985) Vocational Preference Inventory), Academic Locus of Control (as measured by Trice's (1985) scale), and Motivation for Learning (as measured by Mitchell's 1992 Questionnaire on Learning) are examined in terms of how they relate to the dependent variable, Final Average.

Academic Model:

Hypothesis One: There is a body of literature (Wolfe & Johnson, 1995; Willingham et al., 1990;

Schuler, Funke, & Baron-Boldt, 1990; Wesley, 1994) indicating that high school grades predict college academic achievement. In addition, data previously collected by this author in a preliminary study using data from 1995 Junior RCAT students support that claim. Therefore, the hypothesis that high school accomplishments will be shown to be predictive of grade level achievement for RCAT students is offered here.

Hypothesis Two: It is hypothesized that scores on the standardized tests (the Canadian Adult Achievement Tests [CAAT] in English, Reading Comprehension, and Numeracy) administered at the beginning of first-semester will be predictive of academic achievement for agricultural college students, as shown by final averages for the semester. This working hypothesis is offered on the assumption that proficiency in those disciplines will generalize to enhanced intellectual performance in related - indeed, in all - college courses.

Demographic Model:

Hypothesis Three: While previous agriculture-related experience may prove marginally advantageous to Livestock, Field Crop, and Fruit & Vegetable Production majors when correlated with first-semester academic achievement, it is hypothesized that background will not emerge as a significant variable in the academic achievement equation (Feller, 1974). However, other demographic factors, such as age and gender, may be shown to significantly affect outcomes (Wesley, 1994; Feller, 1974).

Psychological Model :

Hypothesis Four: It could be hypothesized that personality type would correlate with achievement in the various programs. Realistic types could do well in the traditional agricultural disciplines (Agri-

Business and Field Crop Production, and Livestock Production). Investigative types could excel in Veterinary Technology, while Artistic types might do well in Horticultural Production, Landscaping and Nursery Management, and Fruit and Vegetable Production. These effects are predicted as a working hypothesis.

Hypothesis Five: Given the research on Locus of Control (Agnew, Slate, Jones, & Agnew, 1993), a prediction offered in the present study is that Internal, as opposed to External, locus of control will correlate most significantly with first-semester academic achievement at the College.

Hypothesis Six: Given the research on Motivation for Learning (Mitchell, 1992) showing higher academic achievement of students with intrinsic motivation, it is hypothesized that intrinsic motivation will predominate among successful Junior students at RCAT.

CHAPTER III

Methodology

Subjects

Subjects were convenience samples: complete, intact class groupings at Ridgetown College of Agricultural Technology, comprising the entire Junior class (N of valid cases=168), and including all six programs. Major/program groups ranged in size from 14 to 42 students.

Sixty-nine female and ninety-nine male students were included in the sample. Their ages ranged from 17 to 45. Frequencies of student numbers by program and analysis by gender (male-female) are shown in Table 1. Table 2 reports the distribution of their ages, by Program, and Table 3 displays distribution of Background data :Farm or Non-farm.

Instruments

i) High school credit for the highest level (Grade 12 or less, OAC, or post-secondary) successfully completed by each student in English, Biology, Chemistry, and/or Math were obtained from transcripts sent to the Office of the Registrar, RCAT. These courses were selected for this study for specific reasons: proficiency in English (including literacy skills such as Vocabulary, Reading Comprehension, and Written Expression) directly influences an individual's ability to function in today's society - in terms of personal fulfilment, and occupational performance (Psychological Corporation 1989; Pfeiffer & Boogerd. 1997. p. 45). Chemistry, Biology, and Mathematics were selected because the three (as well as other related sciences) are emphasized in all programs at RCAT. In the Veterinary Technology program, preference is given to applicants who have completed secondary school courses in Biology, Chemistry, Mathematics and English at the Advanced Level and achieved at least a B average. Proficiency in these subjects, in addition to documented completion

Table 1Subjects by Program and Gender

	AGB	F.C.	Lvsk.	Hort./F&V	V.T.
Total	43	14	38	40	30
Male	33	13	32	19	2
Female	10	1	6	21	28

Table 2Distribution of Students' Ages, by Program

	AGB	F.C.	Lvsk.	Hort./F&V	V.T.
20 and under	36	10	34	23	10
21 - 24	7	1	3	11	5
25 and over	0	3	1	4	4

Table 3Frequencies of Farm/Non-Farm Background, by Program

	AGB	F.C.	Lvsk.	Hort./F&V	V.T.
Farm	36	14	35	18	11
Non-farm	4		1	18	9

of study, would obviously contribute to success at the College.

ii) Canadian Adult Achievement Tests for Reading Comprehension, English, and Numeracy (CAAT) were developed by the Government of Canada's Department of Human Resources Development and The Psychological Corporation. In 1989, these tests were endorsed by the federal agency as its official measure of educational achievement among adults. Level D, the set of tests administered to RCAT students, was designed for adults with the equivalent of eleven or more years of formal education (upper high-school grades or post-secondary) or students entering college or university. The grade designation refers to the achievement level that can be assessed most reliably. Norms are based on research using a Canada-wide sample from community colleges, school boards, adult basic education centres, Canada Employment Centres, correctional service institutions, and other adult education sites. The Kuder-Richardson Formula #20 was used to determine the internal consistency reliability of CAAT scores. The coefficients ranged from .9 to .95 (The Psychological Corporation, 1989).

iii) Holland's Vocational Preference Inventory [VPI] (1985) is a diagnostic instrument used to prioritize subject interest in 160 career choices. Subjects are informed the VPI will canvass their attraction, or lack thereof, to many kinds of work. The VPI allows for an examination of six career clusters (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional).

The internal consistency of VPI scales, as reported by Holland, ranges from .81 to .91, with an average of .88. For a sample of 115 junior college students (cited in Miller, Knippers, Burley & Tobacyk, 1993), test-retest reliability ranges from .54 to .80 with a median of .71. Holland cites the range of test-retest reliability of the VPI for college freshmen as .61 to .93 (Holland, 1985b).

iv) The Academic Locus of Control Scale for College Students, developed by A.D. Trice in 1985,

reports individuals' perspectives on their own ability to influence academic outcomes. Unlike previous locus of control scales which measured school children's beliefs about their personal control of achievement, Trice's Scale was designed specifically for college students. Results correlate significantly with Rotter's I-E scale (.50) and J.M. Smith's 1973 Need Achievement scale (-.31). Trice does not report internal consistency coefficients, but discusses the psychometric criteria employed: originally, 89 statements consistent with the locus of control concept were written in a true-false format, and the items were tested. Ultimately, 28 items were retained: those which showed diversity of response, temporal stability, and internal consistency (Trice, 1985).

v) Mitchell's Questionnaire on Learning (1992) was developed to measure the constructs of intrinsic and extrinsic motivation for learning, as well as to gauge student self-assessment of learning. Results revealed that student self-assessment of motivational strength was positively and significantly related to intrinsic motivation ($r=.37$, $p<.01$), but negatively and significantly related to extrinsic motivation ($r=-.27$, $p<.01$) Approximately 6.5% more of the variance of student self-assessment of motivational strength was shared with intrinsic than with extrinsic motivation.

vi) A Demographics Questionnaire was assembled by this researcher to garner basic demographic statistics, such as name, age, gender, program of study at RCAT, and information regarding farm/rural or urban/suburban background. Students were also asked to supply information regarding their highest level of academic accreditation (Grade 12 or less, OAC, or post-secondary) in English, Biology, Chemistry, and Math, prior to admission to the College..

Procedures

During Orientation Week at the College prior to commencing classes for Semester One,

Junior students in all major programs wrote a variety of tests. Some of them were instruments that are used routinely at the College (CAAT tests), and others were administered expressly for the purpose of gathering data for this study.

The most advanced level of pre-admission accreditation in English, Math, Biology and Chemistry was noted in student records available from the Registrar.

The Canadian Adult Achievement Tests in English, Reading Comprehension, and Numeracy have been used at RCAT for the past three years. During Orientation Week, before classes began, students were assembled in the Agronomy Theatre, and the CAAT tests were administered - one in each of three distinct sittings of 40 minutes each. The test administrator informed the students that the tests were not I.Q. tests, but merely instruments for assessing levels of competency in literacy and numeracy, with the objective being diagnosis of weaknesses. Test booklets and separate answer sheets were distributed; students were instructed to read each question carefully, decide which was the best answer to the question, and then mark the corresponding space on the answer sheets. They were advised there would be no penalty for wrong answers, and that 40 minutes would be available for completion of each test.

Holland's Vocational Preference Inventory was used to designate personality type. This is an objective personality interest inventory composed of 160 occupational titles, which are printed in double columns on both sides of a test sheet. Respondents were instructed to record their feelings (interested :yes or no) by filling in the appropriate circle on a separate answer sheet. The VPI was administered to each program group during the introductory session of the Communications course. Clarification of the objective of using the VPI (to gather data for this study) was given before the questionnaires were distributed, and students were given the option of participating or not. Ratings

on six personality scales (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) as well as on five personality characteristics scales (Self-control, Masculinity-femininity, Status, Infrequency, and Acquiescence) were obtained.

Locus of control was assessed using Trice's (1985) Academic Locus of Control Scale. Students were given questionnaires during another regular session of their Communications course, and asked to indicate whether they believed the 28 statements made therein were True or False by circling the corresponding letter (T or F) in the margin. Scores were derived by summing the number of externally answered items.

Mitchell's 1992 Questionnaire on Learning poses 12 questions, and asks respondents to indicate agreement or disagreement with each. The questionnaire includes those questions which yielded the highest loadings on the intrinsic and extrinsic motivation factors, as tested by the researcher with college students in Nebraska - six questions indicating intrinsic motivation, and six indicative of extrinsic motivational style. The Questionnaire on Learning was also completed during a regular Communications class.

A questionnaire developed specifically for this study was used to assemble data regarding Age, Gender, and Background (Farm or Non-farm).

Examinations for first-semester courses at RCAT were scheduled between November 11-22, 1996.

CHAPTER IV

Results

Academic Model:

Descriptive information recording data used in the Academic model is given in Tables 4 and 5.

To examine the first hypothesis, a stepwise multiple regression analysis was computed using “first-semester final average” as the dependent variable, and “pre-admission accreditation” (in English, Math, Chemistry and Biology) as the independent variables. None of the independent measures was significant. $p < .05$.

The same analyses were run for the traditional agricultural majors (Agri-Business Management, Field Crop, and Livestock Production), the Horticultural Production, Landscaping & Nursery Management, and Fruit and Vegetable Production majors, and the Veterinary Technology majors. Again, none of the independent measures was predictive. $p < .05$.

In examining the second hypothesis, a stepwise multiple regression analysis was computed using “first-semester final average” as the dependent variable and CAAT percentile scores (in English, Reading Comprehension, and Numeracy) as independent variables. See Table 5 for Means and Standard Deviations. In this analysis, English emerged in the first step, $R^2 = .16$, and Numeracy emerged in the second step, $R^2 = .19$. It seems proficiency in English is the strongest predictor of how well students will do in Agricultural College.

Demographic Model:

To test the third hypothesis, a stepwise multiple regression analysis was computed using “first-semester final average” as the dependent variable and the three demographic variables (Farm or

Table 4Frequencies: Pre-admission accreditation in English, Math, Biology and Chemistry by Major Program

	AGB	F.C.	LVSK	HORT/F&V	V.T.
English					
G. 12 or less	26	9	27	17	2
OAC	10	2	8	17	12
P.S.	7	3		3	9
Mathematics					
G. 12 or less	31	9	27	25	10
OAC	5	3	7	7	5
P.S.	6	2		4	7
Biology					
G. 12 or less	32	9	24	21	3
OAC	5	3	6	8	11
P.S.	3	2		7	9
Chemistry					
G. 12 or less	35	10	26	25	6
OAC	2	3	7	6	7
P.S.	3	1		5	9

Table 5Means and Standard Deviations: CAAT [percentile] scores with Final Average, by Program

	AGB	F.C.	LVSK	HORT/F&V	V.T.
Reading Comprehension:					
Means	38.7	36.7	36.8	51.2	83.9
Standard Deviation	22.2	22.7	27.8	31.5	11.6
English:					
Means	34.4	30.3	33.9	45.3	
Standard Deviation	21.1	18.6	21.6	23.3	
Numeracy					
Means	46.1	38.2	47.6	45.4	98.8
Standard Deviation	21.8	17.7	26.3	25.4	122.3

Non-farm background, Age, Gender) as the independent variables. In this analysis, Age emerged on the first step, $R^2=.07$, and Gender emerged on the second step, $R^2=.10$. Apparently, Age and Gender are relevant predictors, but Farm/Non-farm background does not have an influence. Older students, and females, obtained higher grades.

Psychological Model:

The fourth hypothesis was tested by computing a stepwise multiple regression analysis, using “first-semester final average” as the dependent variable and “personality type” (Realistic, Investigative, Artistic, Social, Enterprising, Conventional - as determined by the VPI) as the independent variable. Descriptive frequencies for personality type, by Program, are given in Table 6.

In this analysis, the Investigative type emerged on the first step, $R^2=.05$. This was the only significant predictor. Those scoring higher on the Investigative scale achieved higher grades.

Subsequent analyses for the three categories (Traditional Agricultural studies, Horticulture and Fruit & Vegetable Production, and Veterinary Technology) were nonsignificant, most likely due to the smaller sample sizes.

To test Hypothesis Five, simple correlation coefficients were computed to examine the relationship between Final Average and Internal Locus of Control, and External Locus of Control. Table 7 presents Means and Standard Deviations of Locus of Control designation distributed among the subjects, by Program. Final Average did correlate with Internal Locus of Control ($r=.23$, $p<.05$). Thus, individuals registering higher on the academic internal locus of control scale obtained higher grades.

In examining Hypothesis Six, simple correlation coefficients were computed to examine the relationship between Final Average and Intrinsic Motivation for Learning, and Extrinsic Motivation

Table 6Frequencies of Distribution: Personality Type, by Program

	AGB	F.C.	LVSK.	HORT/F&V	V.T.
Realistic	14	7	17	12	1
Investigative	8	3	5	21	12
Artistic	8	3	5	20	10
Social	11		8	14	12
Enterprising	18	2	10	9	3
Conventional	13	3	6	8	2

Table 7Internal/External Locus of Control, by Program

	AGB	F.C.	LVSK.	HORT/F&V	V.T.
Internal					
Mean	14.24	12.54	14.97	17.14	19.39
Standard Deviation	3.13	4.54	4.97	4.32	4.34
External					
Mean	13.76	14.50	12.36	10.79	8.61
Standard Deviation	3.13	3.40	5.17	4.31	4.34

Table 8Motivation for Learning: Internal and External

	AGB	F.C.	LVSK.	HORT/F&V	V.T.
Internal					
Mean	7.43	7.50	6.91	8.39	9.11.
Standard Deviation	2.50	2.91	2.20	2.23	2.72
External					
Mean	4.57	4.50	5.06	3.54	2.89
Standard Deviation	2.50	2.91	2.21	2.22	2.72

for Learning. Table 8 provides Means and Standard Deviations for Motivation for Learning. Final Average did correlate with Intrinsic Motivation for Learning ($r=.21$, $p<.05$), and also with Extrinsic Motivation for Learning ($r= -.22$, $p<.05$). The positive correlation coefficient for Intrinsic Motivation for Learning indicates that those higher in Intrinsic Motivation achieve higher grades. The negative correlation coefficient for Extrinsic Motivation for Learning shows an inverse relationship. That is, those scoring low on the Extrinsic Motivation scale obtain higher grades.

CHAPTER V

Discussion

Examination of relationships between first-semester final average (the dependent variable) and the independent measures tested (pre-admission accreditation, CAAT scores, demographic information, and psychological characteristics) was facilitated by stratifying data into three distinct models. Thus, correlations between final average and any other variable became more apparent, and the significance of the relationship(s) was more easily interpreted.

Academic Model:

Results of the current study indicate that, as hypothesized, CAAT scores were predictive of academic achievement for the agricultural college students observed. In fact, English proficiency (as measured by the CAAT scores in English) emerged as the strongest predictor of any investigated, with Numeracy skills following. Thus, the hypothesis that proficiency in the fundamental disciplines of literacy and numeracy generalize to enhanced performance in all college courses was justified by study results. This finding underscores the critical need to provide more, and better, strategies for exposing students to experiences which will empower them to absorb learning, and utilize it in their daily lives.

The literature supports the hypothesis that high school grades are predictive of academic achievement in college. Because actual grades were not used in this study, absolute comparison is not, strictly speaking, possible. However, it is hoped the reader will appreciate the validity of substituting level of accreditation achieved, prior to enrollment, for specific numerical values in high school or post-secondary courses. At issue here is the determination of whether pre-college

educational preparation and experience affect academic achievement in college more significantly than the other variables tested: demographic, and psychological characteristics.

In effect, this study's findings support the Ontario Ministry of Education's implementation of standardized testing as an instrument to assess student learning, by suggesting that such tests are a better measure of student proficiency than teacher reports. The current trend in educational philosophy, to standardized testing in Grades 3, 6, and 9 (currently propelled by a wish to make teachers more accountable for student achievement??), are a step in the right direction, even if the motivation is (in this writer's opinion) misguided. Rather than focus on teachers' accountability (a thinly-disguised decoy being used to rationalize educational expenditures in accordance with the Harris government's obsession with "the bottom line" rather than devote taxpayers' dollars to improving their children's future), might not educational policy focus on developing curricula that reflect the real world and prepare our children to meet the demands their society will make on them?

Demographic Model:

As hypothesized, farm/non-farm background did not emerge as a significant variable in the academic achievement equation. The proposed explanation for the seeming incongruity that previous agriculture-related experience does not prove more than marginally advantageous to agriculture college students involves an examination of the diversified curriculum of institutions such as RCAT. Where once one may reasonably have presumed to find courses on animal husbandry and basic crop production management, one will now discover a diversified approach that encompasses the multi-faceted focus of contemporary Agriculture. The modern agronomist must embrace not only conventional wisdom regarding his or her purview, but must also become accomplished in the

complex disciplines of business, finance, and marketing. He or she must be knowledgeable about and capable of exploiting the ever-increasing power of computer technology to facilitate planning and operation of a multitude of agriculture-related enterprises.

The intellectual capacity enabling the contemporary agronomist to achieve success in his or her chosen area of operation is epitomized by the ability to comprehend and assimilate ongoing research discoveries and developments. That ability is accessible only to those whose literacy and numeracy skills have been developed to adequate levels, primarily through instruction and practice in academic institutions.

Age did emerge as a significant influence, with older (and presumably, more mature and experienced) individuals ranking as more successful than their younger counterparts. Another demographic variable, gender, also showed predictive ability, with females attaining higher final averages in the first semester (mean: 73.94, as opposed to a mean of 67.85 for males). This finding is convergent with other research (Feller, 1974) conducted with agricultural students. That study ranked urban females in the top third of 729 students studied for academic performance, while rural males composed the lower third of achievers. Data gathered for the present study reveals that 35 of the females studied reported having rural or farm backgrounds, while 18 categorized their backgrounds as urban, or non-farm. Statistics for males indicated a larger proportion of them had rural or farm backgrounds (73 individuals) than had urban or non-farm backgrounds (14 males). Therefore, while endorsing Feller's conclusion that females generally achieve better in college, this study's results do not support the suggestion that urban background proves influential among females.

Psychological Model:

While it was hypothesized that particular personality types would emerge as most prominent among successful students in different programs (Realistic types in Traditional Agricultural studies, Investigative types in Veterinary Technology, Artistic types in Horticulture, and Fruit & Vegetable Production), results of this study showed Investigative personalities achieving most successfully across all programs at RCAT. Appreciation of this finding is facilitated by reference to Holland's description (Holland, 1973. 14-15) of characteristics peculiar to Investigative types: those individuals display

a preference for activities that entail the observational, symbolic, systematic, and creative investigation of physical, biological, and cultural phenomena in order to understand and control such phenomena; ...these behavioural tendencies lead in turn to an acquisition of scientific and mathematical competencies ...

Such preferences would seem to correspond extremely well with the philosophy underlying many RCAT courses. That is, as the College's Academic Calendar states,

Ridgetown College's programs offer a valuable blend of practical and theoretical training ... programs provide detailed study in business and operations management ... Students will have access to the latest technologies and production principles, examine how to market goods and services, purchase and sell agricultural commodities and make wise financial business decisions ...

Holland's articulation of characteristics of Investigative personalities inspires speculation regarding the relative propensity for success of similarly-inclined individuals who follow other career

paths. One can easily imagine that the above-mentioned characteristics would enhance the likelihood of success, and personal satisfaction, in such fields as History, Journalism, Science, and many others. Could it be that Investigative types have greater potential for achievement all round?

As hypothesized, the study results show higher academic achievement among students characterized as having Internal Locus of Control orientations. This finding can be rationalized by recalling the research contending that Internals believe themselves responsible for their behaviour, and accept that outcomes are contingent on those behaviours. Thus, we can reasonably assume that successful agriculture college students attribute their academic achievement largely to factors within their own control, that they assume responsibility for those attributions, and consequently, regulate themselves accordingly.

This study's finding that Intrinsic Motivation for Learning (characterized by a desire for self-fulfilment or feeling of competence and accomplishment) was exhibited by the most successful students is consistent both with Hypothesis Six, and with the finding concerning Locus of Control. The prediction that Intrinsic Motivation for Learning would prevail was supported, and seems entirely rational when taken together with the notion that one's own behaviour determines one's resulting situation. Individuals who want to achieve competence, and who know their own choice of behaviours can influence the accomplishment of that goal, will logically be those whose behaviours are congruent with success.

Summary

Is it possible to suggest a profile of "the Agriculture College student most likely to succeed"?

A synthesis of this study's results would suggest that an individual's potential for academic

achievement at Agricultural College would be appreciable if he or she possessed strong literacy and numeracy skills. Personality characteristics like curiosity and an inclination to investigate, an affinity for observing and systematizing, and an interest in understanding and assimilating information would accrue to that student. He or she would personify the psychological concepts of Internal Locus of Control, and Intrinsic Motivation for Learning: that is, the student would have identified goals, would have grasped and rationalized the notion of responsibility for one's self, one's choices and behaviours, and the resulting consequences, and would be prepared to expend the energy necessary to achieve the goals.

This study posits the possibility of predicting students' reasonable expectation of academic achievement, based on identification of the degree to which each individual's personality profile complies with the "ideal" discussed above.

Implications

This study's results suggest that incumbent on colleges and universities is the responsibility for bridging the gap in literacy skills experienced by those applicants who have completed secondary school, but have not acquired adequate facility in communication to enable them to achieve success in their personal and professional lives. Yet, the trend appears to be in the opposite direction. Take, for example, the University of Guelph's decision to limit Communication studies in the OAC program (Ontario Agricultural Colleges such as RCAT) to one semester. This innovation was introduced following the integration of RCAT and two other Ontario Agricultural Colleges (Kemptville, and Alfred) with the University, April 30, 1997. For at least eight years previous to that time, all students at the Colleges enjoyed the benefit of two semesters of scheduled Communications studies in their

Junior year. In the not-so-distant past, students attended four-semester of English instruction at RCAT during their four-semester diploma program.

While many Instructors at the College deplore the low level of literacy skills of students entering courses in Junior year, just as many would agree that most students' communication skills improve as a result of a year of post-secondary written and oral Communications instruction. That improvement seems likely to be minimized, in conjunction with the reduction of the Communications course.

Granted, the first year of any college program would not seem to be the optimum time for refining literacy skills among students: fundamentals such as fluency in both the written and spoken forms of language ideally should be developed in any individual in his or her early years, and could be hoped to be at a high level by the time any student enrolls in a post-secondary educational facility. But, given that such is apparently not the case (an alarming state of affairs that is pilloried daily in the media, and deplored by society in general), is it not critical that colleges and universities attempt to maximize students' potential for success in life by providing them with the best educational opportunities? Does it not then logically follow that, since literacy skills are predictive of achievement in college, and are an integral component of any behaviour (post-college, as well as previous to and during), any contribution the college curriculum can make to students' total store of knowledge about, and proficiency in, literacy, would be beneficial and, therefore, highly desirable?

Development of fundamental literacy levels in language and numeracy must become a paramount objective of educational policies at all levels. Certainly, early education provides the soundest basis for further development of language and communication skills for students. The Ontario Government's 'Back to Basics' reform, and reinforcement of the primacy of language

instruction for all students, augurs well for literacy skills development in children in Ontario schools today. But let us not forget senior students who missed earlier opportunities to develop written and oral communication skills, and who, in their post-secondary school programs, are possibly facing the last chance to refine those life skills in an educational setting before they enter society.

The author of this study decries the current trend of post-secondary institutions to actually decrease, rather than expand, opportunities for students to develop and refine literacy skills; it is predicted herein that cutting English and Communications programs at any level will result in a less literate, less accomplished, and ultimately, less satisfied, population.

Limitations of the Present Study

The fact that this study is particularized to Ridgetown College of Agricultural Technology implies immediately that results may not be generalizable to other populations, considering the unique characteristics of the College. However, it is hoped that trends will be established regarding the predictability of first-semester grades, and that their implications will be transferrable to other college student populations.

Suggestions for further research:

Findings of this study provide grounds for questioning the conclusion (Astin, 1993; Quilter, 1995; Benzinger, 1996) that, in general, OAC grades are the strongest predictor of academic achievement. Many students considered in this study did not possess OAC accreditation, while several had completed post-secondary credits in the subjects examined. And, the fact that previous research examined achievement of students in first-semester university programs as opposed to this study's

focus on agricultural college students raises questions about differences between these two groups of students. Do those differences lie primarily with the students themselves - their academic abilities, their personality characteristics, and other individual variables, or do they pertain more accurately to the institutions themselves, and the programs each offers?

Possibly, analyses in this study were skewed by the lack of actual grades used in the academic equation (as opposed to identification of pre-admission accreditation by level only). Further analysis might involve correlation analyses of actual pre-admission grades in English, since analyses here showed correlation between pre-admission level of accreditation and achievement on the CAAT English test.

Additional support for this study's findings might be accumulated by correlating second, third, and fourth semester academic achievement with the academic, demographic, and psychological factors employed herein.

Another avenue for additional research involves the question of whether or not Investigative personalities (as identified with Holland's 1985 Vocational Preference Inventory) can be seen to be more successful in other academic disciplines and corresponding careers, relative to individuals better described by one of Holland's other personality type designations.

APPENDIX A - LETTER of INFORMED CONSENT

To: All Junior students, RCAT
From: D. Brittan, Communications Lecturer.
Re: Participation in research study.

This letter is a request for your participation in a research study that will constitute the final credit towards my degree of Master of Education, University of Windsor. The title of the study is as follows: A Comparative Study of Predictors of Academic Achievement for First-Semester Agricultural College Students at RCAT, Employing Academic, Demographic, and Psychological Variables.

Some of the tests and questionnaires you will be asked to complete during Orientation Week, and possibly at other times throughout the semester, are instruments previously employed by the College for gathering statistical information about students. For example, the Canadian Adult Achievement Tests (CAAT) were designed and are used to designate a level of competence in literacy and numeracy for each respondent. Students identified as being at risk in one or more of the areas tested will be advised of weaknesses and provided with opportunities for improvement.

This researcher will make use of the CAAT scores, along with transcripts of previous grades from high-school or post-secondary institutions.

You will be asked to complete a Demographics Questionnaire, which simply seeks information about gender, age range, previous education, and general areas about background (rural or urban, familiarity with animals, career goals).

The psychological factors instruments include brief questionnaires designed to record information about personality style, direction and motivation for learning.

My intention is to statistically evaluate the contribution each of the above variables makes to a formula for academic success for Juniors in first-semester at RCAT. It is my hope this information will be useful both to prospective students and to College administrators.

Regarding confidentiality: Academic transcripts and CAAT scores are property of the College. Students will be notified confidentially of their CAAT scores through letters to be obtained from Staff Advisors. All personality instrument scores will be available from me, by individual appointment. Statistics used throughout my study and subsequent Thesis Report will reflect groups, not individuals, and names will not be disclosed.

Participation in the demographic and personality data collection of this study is voluntary; you have the option of refusing to participate, or of withdrawing from the study at any time. The CAAT tests are mandatory, required by the College.

I am willing to answer any questions regarding this research study before or following the testing sessions. My office is in the RCAT Library, in the Reek Building. My office phone number is 674-1539.

Any complaints about this research study may be directed to me, or to Dr. L. Morton, Chair, Ethics Committee, Faculty of Education, University of Windsor: (519) 253-4232, Ext. 3800.

Thank you for your participation. Have a great year!

D. Brittan
Communications Lecturer
RCAT

I hereby consent to participate in this research study.

NAME: _____

PROGRAM: _____

DATE: _____

APPENDIX B - DEMOGRAPHICS QUESTIONNAIRE

NAME: _____

PROGRAM: _____

Please place a checkmark in the appropriate place:

AGE:

17 or under _____ 25 - 30 _____ 41 - 45 _____

18 - 20 _____ 31 - 35 _____ 46 - 50 _____

21 - 24 _____ 36 - 40 _____ 51 or over _____

GENDER:

Male _____ Female _____

EDUCATION: Please checkmark the highest level of achievement in the following academic areas:

English: Grade 12 or less _____ OAC _____ Post-secondary _____

Biology: Grade 12 or less _____ OAC _____ Post-secondary _____

Chemistry: Grade 12 or less _____ OAC _____ Post-secondary _____

Math: Grade 12 or less _____ OAC _____ Post-secondary _____

BACKGROUND: Please check the appropriate response:

Did you grow up on a farm or in a rural area? yes _____ no _____

Did you have domestic pets? yes _____ no _____

Did you have large animals (horses, for example) yes _____ no _____

Were you responsible for large animals? yes _____ no _____

Has a career in an agriculture-based field been a long-time goal? yes _____ no _____

Has a career in Veterinary Technology been a long-time goal? yes _____ no _____

APPENDIX C - QUESTIONNAIRE on LEARNING

NAME _____

PROGRAM _____

Indicate your agreement or disagreement with the following statements by circling the appropriate answer:

A (agree) / D (disagree).

- | | | |
|---|---|---|
| A | D | 1. The human being's desire to learn and understand is what makes the individual life worth living. |
| A | D | 2. The evidence that people with more education earn more money is what really makes the case for higher education and learning. |
| A | D | 3. Learning for learning's sake promises much and delivers little; learning for occupational success delivers as much as it promises. |
| A | D | 4. The search for meaning in life is given strong support by a mind that is continually looking for new learning, insights, and understanding. |
| A | D | 5. General education has little appeal to me; I want to concentrate on the preparation necessary for vocational success. |
| A | D | 6. There is a certain excitement in new learning of any kind, and it truly enriches life. |
| A | D | 7. A commitment to life-long learning is a commitment to a rich and satisfying life. |
| A | D | 8. Learning that helps you acquire the background for occupational success is more important for the individual than any other kind of learning. |
| A | D | 9. Learning that does not contribute to one's likelihood for occupational success is not worthwhile learning. |
| A | D | 10. Learning should be viewed as a stepping-stone to vocational success. |
| A | D | 11. If you go to college or university for vocational purposes only, you miss a lot of other classroom experiences that are just as important, if not more important. |
| A | D | 12. The love of learning is what keeps me going. |

APPENDIX D - ACADEMIC LOCUS of CONTROL SCALE**NAME:** _____**PROGRAM:** _____Indicate your opinion of the following statements by circling the appropriate letter:

T for True, F for False.

- | | | |
|---|---|--|
| T | F | 1. College grades most often reflect the effort you put into classes. |
| T | F | 2. I came to college because it was expected of me. |
| T | F | 3. I have largely determined my own career goals. |
| T | F | 4. Some people have a knack for writing, while others will never write well no matter how hard they try. |
| T | F | 5. I have taken a course because it was an easy good grade at least once. |
| T | F | 6. Professors sometimes make an early impression of you and then no matter what you do, you cannot change that impression. |
| T | F | 7. There are some subjects in which I could never do well. |
| T | F | 8. Some students, such as student leaders and athletes, get free rides in college classes. |
| T | F | 9. I sometimes feel that there is nothing I can do to improve my situation. |
| T | F | 10. I never feel really hopeless - there is always something I can do to improve my situation. |
| T | F | 11. I would never allow social activities to affect my studies. |
| T | F | 12. There are many more important things for me than getting good grades. |
| T | F | 13. Studying every day is important. |
| T | F | 14. For some courses, it is not important to go to class. |
| T | F | 15. I consider myself highly motivated to achieve success in life. |

- | | | |
|---|---|--|
| T | F | 16. I am a good writer. |
| T | F | 17. Doing work on time is always important to me. |
| T | F | 18. What I learn is more determined by college and course requirements than by what I want to learn. |
| T | F | 19. I have been known to spend a lot of time making decisions which others do not take seriously. |
| T | F | 20. I am easily distracted. |
| T | F | 21. I can be easily talked out of studying. |
| T | F | 22. I get depressed sometimes and then there is no way I can accomplish what I know I should be doing. |
| T | F | 23. Things will probably go wrong for me some time in the near future. |
| T | F | 24. I keep changing my mind about my career goals. |
| T | F | 25. I feel I will someday make a real contribution to the world if I work hard at it. |
| T | F | 26. There has been at least one instance in school where social activity impaired my academic performance. |
| T | F | 27. I would like to graduate from college, but there are more important things in my life. |
| T | F | 28. I plan well and I stick to my plans. |

CHAPTER III**References**

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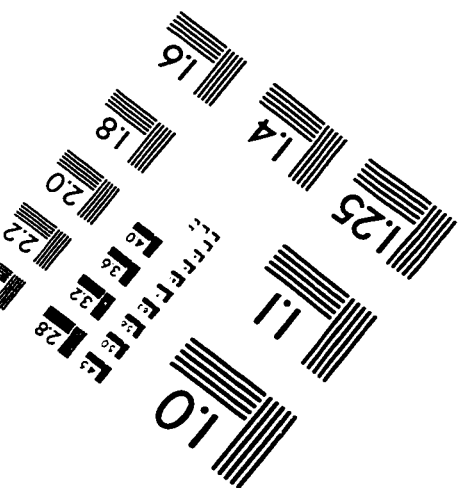
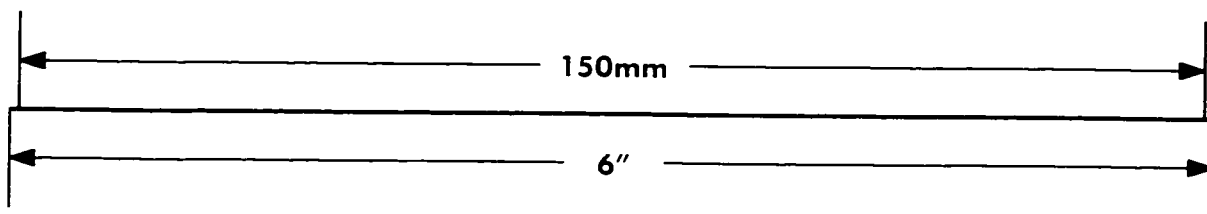
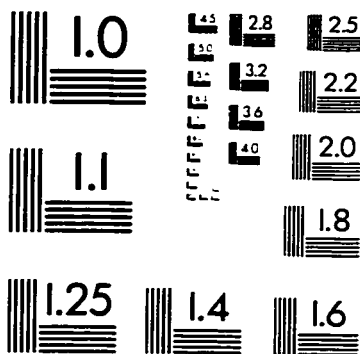
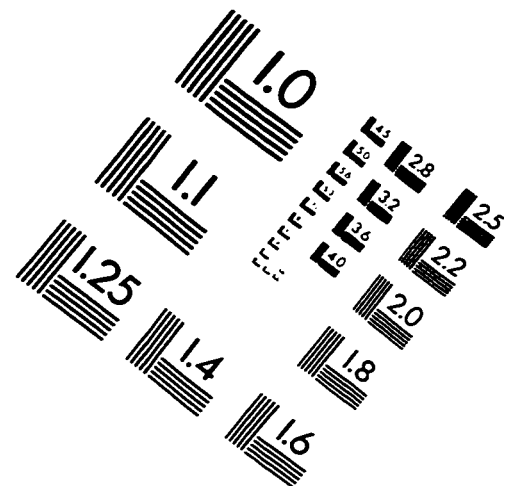
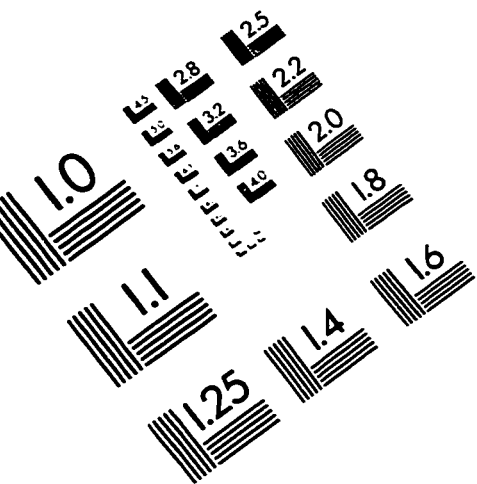
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